Preface Figure Captions:

Near right: SeaStar satellite carrying SeaWiFS sensor. (Image courtesy of the NASA GSFC Scientific Visualization Studio. http://svs.gsfc.nasa.gov)

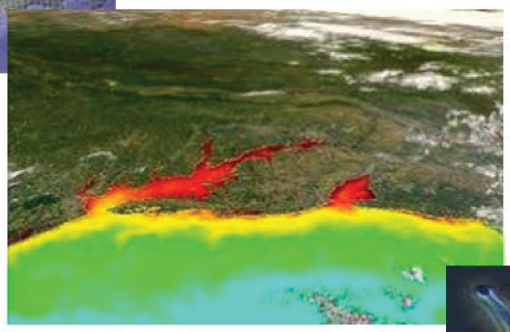
Middle right: SeaWiFS false-color chlorophyll image of the Delmarva coastline. (Image courtesy of SeaWiFS and GeoEye)

Far right: *Protoperidinium oblongum* phytoplankton cell. (Image courtesy of the Station Biologique de Roscoff, CNRS and UPMC).

This premier issue of *Rising Tides* starts big by examining some of the latest National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA) research related to large-scale oceanographic processes. Studying questions that involve large spaces (spatial) or periods of time (temporal) is challenging. Explore and discover the many ways scientists are meeting these challenges. "Ocean Watch" describes how scientists have established a coastal observatory. Such an observatory can be used to design a study that could not be addressed on a single research cruise or with a simple sampling scheme. One current issue that could be addressed using a coastal observatory is climate change. Global warming is a topic that has recently been in the news. In order to understand how anthropogenic CO_2 could influence climate, scientists must first study how carbon moves through the terrestrial and oceanic environments. There are still unanswered questions concerning the carbon cycle in the ocean. The role of very small phytoplankton (picophytoplankton) in the coastal carbon cycle is not well understood and the movement of dissolved carbon through coastal waters is still being researched. "Good Things Come in Small Packages" and "The Coastal Ocean Carbon Cycle from Space" explain some of what is known about picophytoplankton and dissolved carbon, respectively, and describe future research directions. Another recent topic in the news is harmful algal blooms. A very large bloom occurred last summer off the coast of New England. The extensive spatial scale made it obvious that small scale sampling could not adequately cover the bloom. Coastal observatories should be immensely helpful in increasing our knowledge of harmful algal blooms on the appropriate scales. "What is a Harmful Algal Bloom?" describes the many different types of harmful algae blooms that can occur. Used together, these articles will hopefully encourage students to think about the ocean on many different scales (from tiny picophytoplankton to global movements of carbon) and show them some exciting new research in oceanography.

SeaStar satellite carrying SeaWiFS

SeaWiFS false-color chlorophyll image of Delmarva coastal waters



Protoperidinium oblongum phytoplankton